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ABSTRACT

As an applied discipline based on evidence and guided by economic principles, the ultimate aims of the economics of education should be to influence outside opinion and shape policy. In a major court case based heavily on the economics of education, it can be seen how this knowledge base was interpreted by the New York Supreme Court on public-school funding in "Campaign for Fiscal Equity versus The State of New York" (2001). In this highly praised ruling, known as the "DeGrasse" decision, the court drew heavily on research evidence, along with direct testimony from noted academic economists and educationalists. Yet the court also challenged this evidence and testimony on both empirical and methodological grounds. The ruling therefore reflects a considered "outside opinion," and one made by an agency--the judiciary--with substantial influence both on policy and on the views of society at large. This article reviews the economic content of the ruling, that is, what the courts think about the economics of education. It also considers whether the benefits of court-mediated policies exceed the costs, that is, whether economists should view the courts as a good way of influencing policy. (Contains 61 references.) (Author/RT)

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National Center for the Study of Privatization in Education

Teachers College, Columbia University

The Economics of Education on Judgment Day

Clive R. Belfield and Henry M. Levin[1]

July 2001

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Abstract– As an applied discipline based on evidence and guided by economic principles, the ultimate aims of the Economics of Education should be to influence outside opinion and shape policy. In a major court case based heavily on the Economics of Education, we can see how this knowledge-base was interpreted by the New York Supreme Court on public school funding in *Campaign for Fiscal Equity* versus *The State of New York* (2001). In this highly-praised ruling, known as the DeGrasse decision, the Court drew heavily on research evidence, along with direct testimony from noted academic economists and educationalists. Yet the Court also challenged this evidence and testimony, on both empirical and methodological grounds. The ruling therefore reflects a considered 'outside opinion', and one made by an agency – the judiciary – with substantial influence both on policy and on the views of society at large. This article reviews the economic content of the ruling, i.e. what the courts think about the Economics of Education. We also consider whether the benefits of court-mediated policies exceed the costs, i.e. whether Economists should view the courts as a good way of influencing policy.

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1. INTRODUCTION

In lauding Economics, Lazear (2000, 99) claims: "By almost any market test, economics is the premier social science. The field attracts the most students, enjoys the attention of policy-makers and journalists, and gains notice, both positive and negative, from other scientists." Within the discipline, the Economics of Education is heralded as offering guidance for making education more efficient and equitable. Indeed, over the last 40 years, a substantial corpus of knowledge and evidence has been generated on, *inter alia*, educational production and costs, returns to educational investments, teacher markets and education finance. Yet there is surprisingly little direct testing of the success of the field at influencing policy and 'outside opinion'. And within the profession more broadly, there is substantial disagreement on basic economic parameters (Fuchs et al., 1998). Ultimately, the test of the usefulness of findings and insights from the Economics of Education is how they shape policy reform. At issue, then, is how to perform this test; and how the discipline performs against such a test.

A useful way to test the discipline's influence is to look at key legal decisions on financing education. Over the last three decades, there have been legal challenges to equity of public education funding in 43 US States. Along with their substantive impact on funding, such challenges offer a forum for debating the purposes of research within the discipline. Courts draw upon social science arguments and evidence, and the court decisions indicate how compelling particular arguments were. In addition, court cases, in their use of expert witnesses, interrogation of noted educational researchers and personnel, access to documents, as well as engagement with public opinion and academic discourse, create a substantial evidence base on public education in the US. The resulting rulings reflect an important 'embodied knowledge' about public schooling in the US. Moreover, these rulings provide explicit references to the evidence base used and how this evidence is interpreted. Court decisions – the outcomes of full, lengthy and considered deliberation on an

issue – can therefore be used to evaluate the contribution of Economists of Education to key issues of education reform.

Recently, a landmark decision was made in *Campaign for Fiscal Equity et al.* versus *The State of New York et al.* on education funding within New York City Public Schools (herein referred to as the DeGrasse decision). After an eight-month trial, Judge Leland DeGrasse ruled that New York State was failing to provide "the opportunity for a sound basic education" as mandated by the State constitution, and charged the State to revise its education finance system, so as to make it needs-based. Such revision would be anticipated to substantially increase funding for New York City's public schools (and other areas of highest need). In this case, the Court collected evidence and obtained testimony from a number of noted academic specialists in the Economics of Education (including Robert Berne (New York University), Ronald Ferguson (Harvard), David Grissmer (Rand Corp.), Eric Hanushek (Stanford), Hamilton Lankford (State University of New York at Albany), Henry Levin (Teachers College), and Michael Podgursky (Missouri)), as well as high-ranking educational specialists.[3] The purpose of this article is to set out three areas of analysis embedded in this court decision and to compare the knowledge base in the Economics of Education in these areas with the court's decision. In many cases, the academic literature is divided on an issue, so the court took one side. It is useful to ascertain not only what the court accepted, but also what economic arguments it rejected, and to assess more broadly what influence the discipline has had on the courts.

The paper will be organized in the following way. First, a short history leading to the case pressed by the Campaign for Fiscal Equity will be presented, along with the contentions of the plaintiffs and defendants and the basis for their claims. Second, the paper will set out three areas in

[3] In addition the Court obtained testimony from other social scientists, including: Mark Alter (NYU), David Armor (George Mason U), Linda Darling-Hammond (UCLA), Jeremy Finn (SUNY), Norman Fruchter (NYU), James Guthrie

which the Economics of Education played a central role: the treatment of educational outcomes; the treatment of educational inputs; and teacher salaries and labor markets. Third, the paper will address what economists can learn from the court's perspectives on school systems and how these perspectives might shape future inquiry. Finally, the paper will investigate whether economists should look to the courts as an outlet for policy influence, i.e. whether the returns to influencing the courts are greater than the returns from other more direct policy routes.

2. *CAMPAIGN FOR FISCAL EQUITY* VERSUS *STATE OF NEW YORK*

The initial action leading to *Campaign for Fiscal Equity et al.* (CFE) versus *The State of New York et al.* was filed in May 1993. This action differed from the previous salient case of *Board of Education, Levittown Union Free School District* (1982). In that case, the court rejected an argument that State funding was inequitable, but left open the possibility that State funding was inadequate. In keeping with a wave of State cases, the *CFE* directed its claims toward the adequacy of educational funding, not equity, and two claims were tried between October 1999 and May 2000 applying adequacy standards to New York City public schools.

The first of the plaintiffs' claims was that "the State has failed to assure that New York City's public schools receive adequate funding to afford their students [the opportunity for] a 'sound basic education' guaranteed by… the New York State constitution." The second claim was that the State's funding mechanisms have an adverse and disparate impact upon the City's minority students, in violation of Title VI of the Civil Rights Act of 1964.

The State (through the Governor and the State Tax Commissioner) contested this claim with a set of arguments. The defendants argued that New York State spends more per student than all but three other states. Therefore any deficiencies were the fault either of New York City, for failing

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(Vanderbilt), Richard Jaeger (U North Carolina), Christine Rossell (Boston), Thomas Sobol (Teachers College), Herb Walberg (U Illinois-Chicago) and Michael Wolkoff (Rochester).

to contribute a sufficient funding amount, or of the City's Board of Education, for failing to adequately manage its funding. The defendants argued that sufficient resources were available to the New York City schools, but the Board of Education was spending the money inefficiently (through waste, corruption, and fraud). Finally, the State argued that the City of New York failed to supplement state funding adequately.[4]

In January 2001, State Supreme Court Judge Leland deGrasse ruled in favor of the plaintiffs and charged the State to substantially increase funding for New York City public schools. The court charged the State to ensure: "sufficient numbers of qualified teachers, principals and other personnel; appropriate class sizes; adequate and accessible school buildings… ; sufficient and up-to-date books… ; suitable curricula… ; adequate resources for students with extraordinary needs; and a safe, orderly environment." Rather than addressing claims of mismanagement directly, the court ruled that the State should be held accountable, even if subordinate agencies fail to meet managerial requirements and local revenue-raising is insufficient. The reason is that the State has constitutional responsibility for its schools including financing and operations, even if relegating this responsibility to local educational agencies. Thus, it is up to the state to address any deficiencies in its schools.

In terms of systemic re-organization, the court charged the State to a 'threshold task' of determining the costs of each element of a sound basic education. This task was preparatory to fulfilling a number of requirements:

- to ensure every school district has the resources necessary for providing the opportunity for a sound basic education;
- to take account of variations in local costs;

4 Unlike the other 682 school districts, the largest five school districts in New York State (of which New York is one) have no independent revenue generating authority through property taxes. These districts cannot levy taxes to fund school budgets, and rely on local municipal government and citywide taxes. Hence the State has an important role in setting the tax structures, tax rates and debt capacity.

- to provide sustained and stable funding in order to promote long-term planning by schools and school districts;
- to provide as much transparency as possible in how the State distributes aid; and
- to ensure accountability so that it can be ascertained whether reforms provide for a sound basic education and remedy the disparate impact of funding.

Finally, it is possible to estimate – from this decision in favor of the plaintiffs – the scale of re-allocation necessary within the State and the New York public schools system. Although there was some dispute about the amount of the funding disparity, the plaintiffs argued at base that there was a 2% shortfall amounting to $400 million a year. This figure is not adjusted for the demographics of at-risk and educationally needy populations (which would favor New York City even more). The court addressed specific inadequacies among three categories; teachers; facilities; and instrumentalities of learning such as textbooks and materials. For teacher needs, the estimated increase in annual funding would need to be approximately $400 million ($5000 per teacher) in salaries and $34 million in professional development. For a reliable cycle of preventative maintenance, the estimated increase in funding would need to be approximately $327 million a year. For instrumentalities of learning, the court did not offer an estimate of the additional resources required, but under some standard assumptions about costing proportions for education, this deficiency would be no less than $100 million. In total, additional annual funding should be of the magnitude of $850 million, representing at least 5% of the City public schools budget.[5] (However, the court also mandated a thorough costing out study to be conducted prior to any re-allocation or increase of funds).

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5 Given this dis-aggregation, it is possible to speculate where the State has been relatively under-funding New York City schools. On the stylization of education production functions where staffing is around 75% of all operating costs, a proportionate increase in resources would occur where extra resources for staff should be three times the size of the increase for other inputs. From the costs used by the court, extra resources for staff are at most 1.33 times this rate.

The following discussion considers how the court interpreted research in the economics of education to reach this decision.

3. INQUIRY IN THE ECONOMICS OF EDUCATION

3.1 Educational Outcomes

An important focus for the Economics of Education is the study of behaviors and actions of education enterprises (Hoenack, 1994). This analysis relies heavily on theories of industrial organization, but the conventional profit maximization assumption has to be replaced with alternative objective functions (such as the generation of human capital, Rothschild and White, 1995).

In practice, of course, schools are charged with multiple and, often, vague goals for their students (e.g. citizenship, socialization, ensuring college progression, and maximizing test scores). This ambiguity undermines the setting of precise goals and priorities and has stimulated research on incomplete contracts, contract failure, and establishment of educational accountability. As enterprises, public schools have also been depicted as x-inefficient: unclear goals and soft budget constraints encourage them to allocate resources in a sub-optimal manner (see Chubb and Moe, 1992; Shleifer, 1998). Schools with clearer goals, such as accountability for state testing standards and incentives created by school choice, should perform better, even as the public sector faces only weak incentives to specify its objectives more fully and clearly.

Typically, economists of education assume that schools are maximizing academic outcomes such as test scores. This assumption legitimizes a substantial corpus of research on the education production function (Hanushek, 1986, 1995; Pritchett and Filmer, 1999; Hanushek et al., 1996) and a 'policy mechanic' approach to education research (Fuller and Clarke, 1994). Overwhelmingly, this

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Under this stylization, the public school system appears to have been, within the context of general under-funding, relatively under-funding physical inputs rather than teacher inputs.

research has used academic test scores as the outcome measure, although other educational optimands have included economic growth and competitiveness (Bils and Klenow, 2000) or earnings (Burtless, 1996). But, at a general level the robust link is between years of schooling and earnings (Becker, 1964; Tyler et al., 2000; Ashenfelter and Rouse, 1999). Other outcomes, such as graduation rates and drop-out rates, are less convincing. These cannot readily be considered as being maximized subject to a resource constraint. Not only must graduation rates be adjusted for such extraneous factors as local economic conditions, the opportunity cost of study, or credit constraints (Manski, 1989), but the optimal rate will not be 100%, as this would undermine the incentive to study and weaken educational signals (Koshal et al., 1995).

For the CFE case, therefore, the first task of the court was to interpret and specify schooling optimands, and to do so in a way that has operational and substantive meaning for school systems, for schools, and for parents. Based on the New York State Constitution, its school systems have to be organized so as to ensure provision of a 'sound basic education'. Fundamentally, the DeGrasse ruling articulated standards of a sound basic education as productive service on a jury and informed voting at a high level of demands. These two capacities may be representative of a more broad idea of 'civic engagement': citizens as jury members have to be capable of understanding the issues in complex cases (e.g. where DNA evidence is presented) and of voting in a sophisticated manner through understanding and considering competing claims. In addition, the court stipulated that a sound basic education is one that equips individuals for career jobs, i.e. jobs beyond low grade work with flat lifetime earnings profiles.

This definition sets out the social importance of education clearly: jury participation and competence for enfranchisement must be established, along with the development of human capital to provide both social and private returns to productive employment. This specificity offers a clear advance in facilitating debate on the education curricula, program duration, and standards necessary

to meet these social purposes. It also offers direction on important empirical relationships, such as the link between voting and education levels (see the estimations by Shachar and Nalebuff, 1999; but also the direct investigation by Levin and Kelley, 1994; and more general investigations by Behrman and Stacey, 1997). Yet, in some ways this definition of the social benefits of education is quite limited: it is neither as general as 'social capital' nor even Friedman's (1962) "neighborhood effects", for example.[6] Moreover, the court ruling leaves undetermined the balance between the proportion of education to be devoted toward social goals versus private returns (it might be presumed that the social purposes dominate the private returns at lower levels of schooling, for example).

Notwithstanding, this definition is a direct challenge to the economics of education literature. It cannot be said to correspond well with the research emphasis on test scores as measures of school effectiveness. Nor does it correspond with the secondary emphasis on earnings and 'global competitiveness', in that such social outcomes may encourage behaviors outside of production markets, i.e. behaviors which raise utility but not GNP. In fact, the court made clear that its definition of sound basic education was not assessment-related, rejecting the use of the State's Regents examinations as the criterion. It also regarded cross-school comparisons with skepticism. In comparing Catholic and public schools, the former were held to have a different student cohort (e.g. in terms of ethnic mix, limited English proficiency, and special educational needs); to be able to expel pupils who are disruptive; and to often use non-unionized, lower paid teachers. This argument persuasively rejects simple comparisons of student achievement in private/religious and public schools.

Research, particularly empirical research, is limited with respect to how school inputs promote the social purposes of education and the impact across a school cohort or across a

[6] The definition of a sound basic education is also not as expansive as the definitions of other states, e.g. the seven capacities identified in the Kentucky state constitution. Plus, common schooling is not mandated, unlike for example the Ohio state constitution's mandate for a "thorough and efficient system of common schools".

community. Educational outcomes tend to be measured for individuals as "private" returns for them rather than returns to society. The consequence is a neglect of system-wide effects, an inability to contribute forcefully to arguments on how schools produce the social effects of education, and a misunderstanding of the maximands of schools.

In its deliberations, the DeGrasse court did consider specific outcomes as indicators of adequacy. However, these outcomes were not ones that economists typically choose to evaluate education performance. The proceedings covered four measures: (1) how many students graduate on time; (2) how many drop out; (3) the nature of the degrees graduates receive; and (4) the performance of those in higher education at City University of New York. Applying the economic arguments noted above, these outcome measures might be considered of limited pertinence. Both on-time completion and the drop out rate from schooling may be only imperfect measures of schooling quality; to repeat, the 'optimal' drop-out rate is unknown. College performances are also inappropriate proxies for a sound basic education, in that attendance at college represents much more than a basic education and depends heavily on factors extraneous to school preparation. Drawing on more robust economic evidence, the Court asserted that test criteria of high school equivalence such as the GED were not evidence of sound basic education because of the inferior value of the GED relative to the high school diploma in labor markets (Cameron and Heckman, 1993).

Nevertheless, a sound basic education was defined in terms of outcomes, against which educational agencies can be held accountable. This offers some legitimacy for an economic model. An educational objective function can, in principle, be specified to reflect these outcomes. Once outcomes are mandated, then economic analysis can be fruitfully used to model how these outcomes can be met, for given technologies and given input prices. Yet, it is important to note that most

production functions used in the economics of education are based upon a criterion that was not directly specified as part of a sound basic education by the Court.

3.2 Educational Inputs

Given a set of specified outcomes, the educational production function literature is primarily concerned with finding the best combination of inputs, taking account of prices. The court perceived a need to prescribe the inputs that are effective for meeting the standard of a sound basic education (necessarily, even in the absence of prices); and it addressed this directly (including testimony from Hanushek and Grissmer). Two prescriptions are required: the levels of educational inputs and their mix. Ideally, economic research should be able to play an important role in identifying efficient education technologies for the precise educational results that predict juror and voter competence and the ability to obtain productive employment.

The most prominent contribution on this subject is that of Hanushek (1986), which concludes that there is no clear evidence linking educational resource differences to differences in student achievement; this particular article has been cited in over 300 other academic papers (see the up-date by Hanushek et al., 1996). More recently, the conclusion that educational inputs show a random relation to educational outcomes has been undermined by reanalyzes of the Hanushek data set (Hedges et al., 1994; Krueger, 2000). In reviewing the evidence over the past three decades, Koski and Levin (2000, 484–489) note that: the relationship between resources and outcomes is still contentious; and the implications for the management and funding of schools are not straightforward.

Similarly, prescribing the input mix may be extremely difficult: Koski and Levin (2000, 493) maintain that knowledge of the education production function is not sufficient to identify the

optimal input mix.[7] This view is also reflected in an earlier debate on adequacy. Clune (1994, 388) argued that it was reasonably straightforward to list the ingredients for an adequate education and estimated the cost at $5000 per student as a first approximation; Levin (1994, 398) countered that there is "little evidence that we are close to operationalization of these terms either in the form of educational assessment tools or substantiated workplace requirements". Although cost differentials across New York schools have been investigated by Speakman et al. (1996) and by Duncombe and Yinger (2000), these cost exercises were not directly related to a notion of adequacy for a sound basic education.

It is also worth noting the research methods used for both these inquiries, i.e. least-squares, cross-sectional regressions applied to single academic years (for sensitivity analysis see Hedges et al., 1994; Figlio, 1999). Limited experimental research has been conducted, with debate over its scientifically high standards (Krueger, 1999) as against its low external validity for actual policy-making. Also, cost analyses have typically drawn on public-sector accounting data with all of their omissions and distortions relative to accurate cost accounting of actual resource deployments. Such analyses typically include only budgeted school inputs, not the value of student or parental contributions or other in-kind inputs (Levin and McEwan, 2000).

On these issues, the court's ruling appears highly sensible. The court explicitly rejected the argument that funding for New York city schools is adequate; and it did so in such a way as to undermine (implicitly) the need to specify the input mix. The court dismissed the contention of no link between actual inputs and outcomes mainly for two reasons. First, the magnitudes of the resource differentials were held to be so large, that the resources–outcomes link was substantive. This dismissal is in fact consistent with a more nuanced interpretation of the 'money does not

7 This difficulty is reflected in some of the deliberations of the court. In terms of the curriculum, for example, the court offered only very basic statements, linking the needs of particular curricula to the resources required within schools (i.e., that arts and physical education require particular physical inputs).

matter' thesis, where moderate or large differences in funding are viewed as a source of differences in outcomes (see the discussion in Case and Deaton, 1999; Hanushek, 1995). Ultimately, it was the compelling argument.

However, a second source of rejection of the null resources–outcomes link is of particular interest for research in the economics of education. Specifically, the Court showed a sustained willingness to critically evaluate the methodology of extant research work and testimony by the expert witnesses. The court addressed a number of methodological issues. Notably, it gave less credence to testimony based on evidence where the data had been compiled by the defendants without witness participation, but analyzed by an expert witness at the trial. In some cases, the witnesses were unaware of the context and method of data collection. This position emphasizes the need for academics to have a thorough knowledge of the provenance of their data. Also, courts favor extant research, i.e. that which has already undergone peer review, over research commissioned directly for the court (Jasanoff, 2001).

In further rebuttals of the 'money does not matter' hypothesis, the ruling emphasized that multi-year evidence on schooling is needed, rather than correlations from any given year (even where value added is adjusted). A sixth grade reading examination score, it was plausibly maintained, reflects experiences in grades 1 to 5, as well as grade 6. A more critical view may also be that value-added estimation may obscure some of the longer-term, persistent differences across students; Cameron and Heckman's (2001) dynamic model of school attainment illustrates how family background and student ability influence schooling paths, especially in the early years. Instead, the Court referred favorably to the results from the Tennessee STAR trial, where experimental research methods were employed to ascertain the impact of class size (Krueger 1999).

On costs, the Court recognized the paucity of, and problems with, available data. It stressed that resource allocations need to be apportioned at the student level: bottom-up costing approaches,

rather than ones using aggregate budget reports, are superior. The Court also found fault with how resources had been estimated, particularly with analysis that failed to take account of amortization, of transportation costs, and of funding from other private sources.

The ruling thus steered a moderate, yet evidential, path through this contentious debate. The Court rejected the argument that 'money does not matter' and instead held that the low overall inputs to New York public schools were a cause of low outcomes. Focusing on the general input-deficiency rather than the output deficiency, however, is critical because it implies that the input mix was irrelevant: if all inputs were deficient, no "better" mix of inputs at current funding levels would generate a sound basic education.[8] No discussion of the optimal input mix was necessary, therefore. To establish this argument – the inadequate outcomes are a function of all inputs being deficient – required detailed inquiry into the quality of inputs, especially teachers.

3.3 Efficient Use of Teacher Inputs

The largest input cost to education is staffing, and economic inquiry into teacher labor markets has focused on several domains, including teacher deployment, credentials, and pay. Much of this research has been critical of labor usage in the education sector. Schools often fail to hire teachers with diplomas from highly ranked schools (Ballou, 1996). Teacher quality and pay are only weakly linked, with low monetary returns to on-the-job effort (Ballou and Podgursky, 2000). The use of fixed salary scales generates shortages in specific subjects and in regions where the opportunity cost to teaching is high, as well as increasing exits from the profession (Hanushek and Pace, 1995; Dolton and van der Klaauw, 1996; Walden and Neumark, 1995). And, finally, few robust objective predictors of a high quality teacher have been found (Hanushek and Rivkin, 2001).

[8] In addition, the court rejected arguments that public schools themselves provided education that –through mismanagement– failed to be minimally adequate. The inapposite nature of inter-school comparisons and the failure of the defendants to identify specific mismanagement practices reinforced the argument that input specification offers the clearest test of adequacy.

The *CFE* ruling acknowledged these arguments, but set them within the specific context of the New York City public school system, both in terms of its current labor force and the available effective supply of teachers. On teacher certification, the court relied on two stylized facts. First, absence of certification indicates that a teacher is not minimally competent, in effect setting a requirement of mandatory certification. Second, certification itself does not guarantee adequacy. This distinction gains salience when it is recognized that: (a) 10-14% of New York teachers lack certification; (b) uncertified teachers are clustered in some of the lowest performing schools; and (c) special education programs have a high proportion of uncertified teachers. These mismatches – between what is considered as competency and what is actually provided within New York City public schools – are likely to dwarf the technical inefficiencies from, for example, failing to allocate the few high-quality certified teachers appropriately. Efficiency gains may be better estimated from investigation into the aggregate labor force within a school district, rather than cross-sectional surveys of samples of teachers.

On teacher experience, similarly general arguments were proposed. Specifically, the ruling, using evidence from Hamilton Lankford on pass rates for teacher skills tests, argued that "teaching experience of less than two years is correlated with poor teacher quality" (26). This stylized fact could then be related to the rate of teacher attrition by tenure: for New York City, for example, over half of new teachers leave the profession within the first six years. Given this high attrition rate, therefore, more efficient initial allocations of teachers may have less effect on raising education outcomes than either deployment of more experienced teachers or policies that increase teacher retention.

On pay, the key relationship is typically between pecuniary pay and working conditions ('full' earnings) and educational outcomes (with teachers migrating out to schools in the suburbs when the disparity in favor of the suburbs is large). For New York City the teacher salary disparity was

sizable, estimated at 20-36% less than the surrounding areas (adjusting for cost of living differences). Moreover, the opportunity cost of not being a teacher was held to be higher in New York City because the returns to a college education in non-teaching professions were greater in the City than in nearby suburbs. In attempting (unsuccessfully) to rebut the link between pay and educational outcomes, the defendants in the *CFE* case argued, in essence, that teacher quality was 'sorted' across large cities, rather than between the city and suburbs across the State (and this cross-city, nation-wide teaching market was in equilibrium).[9] Further, the defendants argued that lower pay within the city reflected a shorter working day: the trade-off between components of 'full earnings' differed between the city and the suburbs. The unresolved issue here was how 'full earnings' should be measured: even where hours differ across jobs, other characteristics such as fewer numbers of students or lower contact hours may be more important as compensating wage differentials. Nonetheless, although economic inquiry has not identified the specific characteristics of more effective teachers or the key components of wage differentials, higher pay will still be effective in attracting a larger pool of higher quality teachers.

Notwithstanding the under-investment in teaching resources, procedures do still need to be devised to allocate teachers optimally. To the extent that particular teacher characteristics are hard to identify (perhaps compounded by low monitoring or a lack of incentives), simple pay formulae will be used. In fact, the experience of New York public schools illustrates the problems of holding teachers accountable through performance ratings. Specifically, the ratings systems used by the Board of Education to assess teacher quality were judged unreliable by the court in that they served only to identify the very poorest performing teachers, i.e. the ratings were at best binary.[10] Plus,

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[9] This is a peculiar conclusion because it assumes that as long as teachers have minimal qualifications, for example, a BA degree and certification, they are equal in productivity. Of course, in the New York City case, significant numbers were not even certified.

[10] The ruling quotes a former superintendent's testimony that poor ratings are "reserved for those people who were the worst of the worst, those people who are actually – endangering students in what they were doing in the classroom."

where supply of teachers is highly inelastic, the utility of such ratings may be questioned: as attested, it is purposeless to identify unsatisfactory teachers if there is no forthcoming supply at the given wage. General staff rating systems applied at the school level were also criticized. Intended to address multiple objectives, these ratings had the unfortunate consequence of failing to hold schools accountable for any particular input deficiency. Moreover, because such ratings were self-reported, schools had no incentive to report performance accurately. Given the practical failings of both ratings systems, the adequacy of funding for teachers may be best assessed, according to the Court, by using relatively simple indices of aggregate teacher quality, such as certification, and by identifying pay disparities as obstacles to obtaining adequate numbers of teachers of reasonable quality.

4. COURT RULINGS AS RESEARCH

In addition to interpreting current economic research, court rulings are themselves a powerful evidence base: for its ruling, the court made a thorough inquiry into the operation and management of New York City public school system. Both in terms of resources and access to documents, data, and personnel, the Court's investigation far exceeded that typically made by researchers.[11] In addition, the Court had access to detailed information on how resources are actually deployed (rather than how they are reported). This detailed information may highlight important new areas for research inquiry (e.g. teacher ratings).

Most evidently, the funding formula for public schools in New York received critical scrutiny. This formula was found to be extremely complicated (similar criticisms have also been made of other States, e.g. Verstegen, 1998, 58), such that "the State aid distribution system is unnecessarily complex and opaque. It is purportedly based on an array of often conflicting formulas and grant categories that are understood by only a handful of people in State government. Even the

State Commissioner of Education testified that he does not understand fully how the formulas interact" (76). The complexity of funding sheds useful light on the relationship between a school's objective function and its funding constraint.

This funding constraint appears substantially more complicated than may be represented as the product of factor quantities times factor prices for a given technology. Such complexity allows for 'malleability' in the interpretation of the formula, undermining incentives for cost minimization and obscuring budget constraints.[12] Furthermore, allocations of funding may diverge over time, as annual additions (or decrements) of funding are imposed where the formulae appear most malleable or *ad hoc* (with discretionary caps on funds receivable by particular agencies and 'hold harmless' rules). This suggests the need for continuous review of funding allocations. More generally, complex formulae obfuscate the relationship between student need and funding (some official testimony recognized the imperfect match of costs to funding). Ultimate allocations could not readily be justified as either 'rational' (relating education to need or to a rate of return criterion) or 're-distributive' (relating to income). More ominous is the possibility that this complexity will make it very difficult for the court to establish that the State has complied with its ruling. In this respect, economists have drawn attention to how government complexity weakens the need to be efficient and generates entrenched coalitions (Olson, 1982; Shleifer, 1998), and that universal rules are unlikely to be efficient (Sonstelie, 1982). From the court's deliberations, these inefficient behaviors can be identified.

An illustration of 'perverse' (inefficient) responses to economic signals was uncovered in relation to special education funding. Special education students (in self-contained classes) typically

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[11] The plaintiffs began their case in 1993, and the trial itself was of eight months duration. During the trial, 44 witnesses were introduced. The trial was completed in May 2000, and the judgment issued in January 2001. However, the defendants have appealed, and further hearings are on-going.

[12] Whether such malleability is appropriate or not is debatable, but it seems unlikely that public accountability is well satisfied with an allocation of resources that differs substantially (and in undisclosed ways) from the funding allocations

receive 2–3 times more resource than mainstream students, but there are considerable discrepancies in how special educational needs are assessed in practice (see Chambers, 2000), and a detailed set of reform strategies for New York is set out in Parrish (2000). However, given the under-funding of mainstream education, many more New York parents sought to have their children allocated to special education programs so as to receive a reasonable, well-resourced education provision. These programs are not only substantially more costly, but may also be less suitable for students without special educational needs. In New York, where 13% of students are classified as handicapped, over-referral and over-placement represent a substantial extra financing commitment. Expert testimony suggested that New York "would reduce its annual expenditures by $300 to $335 million if students with disabilities were placed in less restrictive settings according to the national average" (87). Although these estimates were challenged, changes to the incentives for referral appear as an important component of a systemic reform strategy.

Looking across both its interpretations and its direct contributions, the court ruling is not then of interest as it sheds new light on the relationship between inputs and outcomes, because it does not do this.[13] Instead, it puts forward some methodological positions that are highly plausible yet not fully embodied in research, and situates its inquiry in the specific organizational context of the school system. In doing so, the court decision illustrates the importance of macro-level evaluations for assessing efficiency, shows how accountability at the system level can be contrived, and indicates how levels of funding can entrench incentives for inefficient allocations of resource.

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declared. (Such malleability suggests further advantages from bottom-up rather than top-down analyses of resource use). It also permits greater allocative efficiency in adjusting input mixes to local price levels.

[13] The court also investigated the adequacy of other inputs, e.g. buildings, with similar conclusions. In a lengthy discussion of the adequacy of school buildings, the court went into specific detail on the social scientific evidence presented. Again, the court criticized testimonies that were set forth without a clear methodology.

5. INFLUENCING PUBLIC POLICY

5.1 The Cost-effectiveness of Court Reform

The above Sections illustrate how the courts may sift and interpret economic evidence in a plausible and compelling way. This suggests economic analysis has some of the influence claimed by Lazear (2000). However, as Sunstein and Holmes (1999) make clear, courts may be appropriate forums for deciding on particular issues, but cannot make judgments that either reflect wider societal preferences or take into account alternative routes to the same end. At issue, then, is whether economists should engage in, or look to, reform through the courts, or instead seek policy reform via alternative routes. As a profession, economists have to choose whether investments in their role as expert witnesses to interpret the present knowledge base exceed the marginal returns from substitute activities, such as further academic research (see Posner, 1999; Mandel, 1999). And this choice must be framed within the context of economics as an applied science, where economists can select areas for study. To assess whether legal reform is a worthwhile investment of time, it is necessary to itemize the challenges to court-mandated reform and to calculate a cost–benefit return.

Beginning with the costs, much has been made of the fact that the courts have neither 'the power of the sword' nor the 'power of the purse' to effect (educational) reform (Rosenberg, 1991). Both these criticisms may be apposite but the courts may also lack two related powers. First, the defendants may often fail to recognize and concede the court's legitimacy (particularly when the arguments are contentiously developed). Where the case rests on social science evidence, the defendants may argue that, politically, the evidence has not reached a consensus (Stark, 2000), and so compliance will be incomplete. Second, in such cases, it is often difficult for courts to recognize when or if the defendant has complied (see the State cases in New Jersey and West Virginia). Ward (1998, 221), in his historical survey, argues that the political power in the suburbs makes school finance reform very difficult to achieve legislatively. He emphasizes, as does Rebell (1998), the need for political engagement in the reform process. Education finance reform may be subverted, with

funding being leveled down rather than leveled up. Also, education reform may be very slow; a decade may pass between the action and the solution (particularly where, as in New York, the defendants appeal). Further, court reforms might stall other reforms: the use of judicial review may narrow the options available to the legislature (Colwell, 1998).

Relatedly, many court judgments do not specify the remedies required in such adequacy cases, simply ruling on the merits of the case and deferring to legislatures for the remedies (Colwell, 1998, 82). This deferral may reflect the court's inability to devise solutions for complex social problems or to specify the costs to be incurred for a sound basic education. For example, the judge in *Meyers v. Board of Education* explicitly declared the court ill-equipped to resolve such matters, deferring to the expertise of school administrators (Galvin, 1998). In effect, this gives politicians and administrators wide discretion as to their new obligations.

Against these costs must be set the achievement of a more equitable and efficient system of education financing. As well, there may be other benefits of court victories. There may be precedents which other courts can cite (although this argument could have been made about the 1980s rulings which went against the adequacy claims). Legal cases offer a focus for public engagement (although legal victories may require such public engagement, Rebell, 1998). Even the initiation of a court action may prompt concessions from the school board (e.g. the pre-trial settlement in Baltimore, see Cipollone, 1998).[14]

Each of these issues affects the net expected benefits from victory by the plaintiffs, where total benefits are to be compared against the direct costs of bringing such court cases. These costs of litigation can be separated into three sections: (a) case preparation by the plaintiffs; (b) case

14 However, public reaction in Baltimore City was adverse, with a feeling that the Mayor had ceded control; and claims by the Teachers Union that their collective bargaining rights had been undermined. Similarly, Ward (1998) reports that even when the Illinois Supreme Court dismissed the case of the Committee for Educational Rights, the legislature sought to introduce changes to per pupil spending and property taxes, undermining any link between the court decision and education reform.

preparation by the defendants; and (c) trial costs. Using 2000 prices, estimates of (a) and (b) are at least $20m (with $11.4 million for external representation for the defendants, Feiden, 2001). On conservative estimates, the total cost of (a)-(c) is approximately $40 million spread across eight years (a typical duration from filing a case to the ruling).[15]

The benefits of litigation can also be expressed in money terms. But these must be the expected benefits, prior to the start of the trial and not simply derived from successful cases. At the start of the trial, the expectation of victory can be estimated as the probability of past victories in similar cases: the success rate is approximately 40% (16 reforms to school finance out of 43 cases, Murray et al., 1998, Table 1). Where the courts do rule in favor of reform to the education finance system, Murray et al. (1998, 807) report that the overall net effect is to increase spending by 11% in the poorest school districts and by 8% in the median district. As an approximation, one quarter of New York city public schools are assumed to obtain an 11% increase in funding and another quarter an 8% increase, and that this is applied immediately on resolution of the case for the next ten years. With annual expenditure of $11 billion on New York City public schools, the rate of return to initiating a court action is approximately 30%.[16] Thus, such legal actions appear to offer a reasonable rate of return as a policy reform.

5.2 Education reforms outside the courts

Notwithstanding the above, it may be questioned whether the court can – even where the plaintiffs are victorious – prescribe a sufficient augmentation of resources for ensuring adequacy. Is the amount of extra funding substantively important enough to redress the kinds of inequities identified by the plaintiffs? Unfortunately, there is only limited empirical work on what magnitude

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15 Of critical issue for a cost-benefit analysis of litigation is who bears the costs. Although the legal team of the plaintiffs may work *pro bono*, it is still appropriate to consider the opportunity costs of such work. Adopting an aggregate perspective, all direct costs are included. However, other possible benefits, such as increased housing values reflecting the improved quality of public services (Dee, 2000), are not included.

16 Sensitivity analysis was applied to this figure through changes to the costs of the court case and the increase in funding. No rate of return estimate below 20% was obtained. Details available from the authors.

of resources would be needed to ensure the three domains of a sound basic education. In a national simulation, Heckman (1999) shows that the likely educational investments needed to obtain broad economic equity or redress past decades of increased inequity are vast, much greater (proportionately) than the judgment mandate costed out at $850 million (for a similar conclusion see Roemer, 1998). As well, state cases may have little impact on overall inequalities of funding: Murray et al. (1998) report that two-thirds of the inequalities in funding of education are across states and only one-third within states. Although it may be considered churlish to argue that the courts have "not done enough good", it is worth investigating either whether complementary political or economic change is also necessary, or indeed whether these channels offer greater prospects for reform.

Political reforms (through Federal, State, local or community actions or through referenda) and economic changes (e.g. through greater school choice, privatization or voucher schemes) may have some advantages over legal challenges. In particular, these changes may be less vulnerable to subversion by the legislature (in that the interests of the legislators are aligned with such reforms). Court reforms may require other prior changes in political preferences: democratic reform, rather than simple developments in legal doctrine, appear as the main source for instigating such cases (Rebell, 1998, 24). Political and economic reforms may also be relatively immediate: for example, the introduction of charter schools or more competition may take only a school year. Also, economic changes may be sustained: parents may be unwilling to give up open enrollment; charter school contracts may be written for lengthy periods. Generally, such reforms alter the incentives, prices and endowments of agents within education systems; in this respect they carry both the power of the sword and the purse. Finally, alternative reforms themselves might reflect better on society (Colwell, 1999). Court-mandated change creates 'winners' and 'losers' rather than a sense of social cohesion based on agreement of shared objectives. The winners may have their expectations raised

that court decisions *are* reform (rather than mandating reform), as well as presume the reforms will necessarily improve on the status quo (for how such expectations play out over generations, see Patterson, 2001). The losers may still believe in their position and seek to avoid or offset the impact of the legislation. This adversarial scenario can be juxtaposed with a political reform, perhaps through a referendum, where greater social consensus is reached. Such social consensus may be more stable in the longer term and embody general willingness to effect change.

However, political and economic reforms may be more risky. They may require coalitions of support that are simply not existent (referenda on vouchers, for example, appear as losing propositions). More importantly, economic changes may exacerbate social inequities in exploiting efficiency–equity trade-offs (although this need not be the case if, for example, voucher schemes are targeted at those with low incomes). Estimates of the efficiency gains are much more well-developed than estimates of the impact on equity. In this critical aspect, then, the direct equity effect of court-reform appears to be its strongest advantage.

6. CONCLUSION

In *Daubert v. Merrell Dow Pharmaceuticals, Inc.* (1993) the US Supreme Court placed the expectation on federal judges to "think like scientists" (Jasanoff, 2001). So in cases where expert witnesses offer evidence, courts are expected to evaluate this evidence on its merits. If this task is contentious for science, it may be especially contentious for social science: social scientists may differ not only in their beliefs but also their values; compelling, consensual evidence is much less common; and some social science evidence may be inadmissible (Stark, 2000).

However, based on discussion of three fundamental topics within the Economics of Education, a more positive outlook is warranted. Courts can navigate well through (disputed) social science arguments regarding educational outcomes, educational inputs (the education production function), and the deployment of teacher inputs. Moreover, rulings themselves can offer useful

guidance to researchers on what fields of inquiry are important for resolving key public policy concerns, on what empirical evidence and which methodologies are deemed most valid, as well as indicate new areas for academic interest. Finally, in comparison with alternative political and economic reforms, legal challenges may be particularly cost-effective in ensuring that States meet the adequacy standards set for them in their constitutions.

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ENDNOTES